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☐ 1. Document ID: US 20030103661 A1

L2: Entry 1 of 23   File: PGPB   Jun 5, 2003

DOCUMENT-IDENTIFIER: US 20030103661 A1
TITLE: Medical-use image recording apparatus and medical-use imaging system

Current US Classification, US Primary Class/Subclass (1):
382/128

Current US Classification, US Secondary Class/Subclass (1):
382/254

Detail Description Paragraph (8):
[0094] In the recording head unit 120, there are provided recording heads 120a to
120d respectively containing 4 kinds of black ink of different densities, and a
recording head control signal corresponding to the image signal is supplied from the
control means 101 to each of them. These recording heads 120a to 120d may be built
integrally or may be provided separately. In this way, by the image formation using
different black inks of 4 kinds, as an image for the purpose of diagnosis or
reference for medical treatment, an image having a higher image quality and a larger
number of gray scales can be obtained. In order to produce an image for medical
treatment which requires multiple gray scales, it is desirable to use black inks of
at least 3 to 4 kinds having different densities respectively. Besides, in order to
dissolve the streaky unevenness peculiar to a medical-use image recording apparatus,
it is necessary to jet ink drops uniformly from the recording head towards the
recording surface; as the result of it, with the increase of ink absorption amount,
it is necessary to make the ink receiving layer thicker. If the ink receiving layer
is made thicker, damages tend to be produced on the surface of the recording medium,
and more attention should be paid to the handling of the recording medium.

| Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Image |

☑ 2. Document ID: US 20030090742 A1

L2: Entry 2 of 23   File: PGPB   May 15, 2003

DOCUMENT-IDENTIFIER: US 20030090742 A1
TITLE: Image processing apparatus and image scanning apparatus

Current US Classification, US Primary Class/Subclass (1):
358/448

Current US Classification, US Secondary Class/Subclass (1):
358/461

Detail Description Paragraph (33):
[0115] A description will now be given, with reference to FIG. 20, of an example in
which the abnormal pixel correcting part 28 uses the statistics to correct the read
image data. The abnormal pixel correcting part 28 maintains a flag in a position

where an abnormal pixel has been detected. A detected signal "1" means that the pixel in the position is abnormal, and a detected signal "0", by contrast, means that the pixel in the position is normal. The abnormal pixel correcting part 28 determines reference pixels, which serve to correct the abnormal pixels, in the neighborhood of the detected abnormal pixels. The reference pixels are points a and b. The point a is located at the position before the detected abnormal pixel, and the point b is located at the position after the detected abnormal pixel. These points a and b should be located at positions where the abnormal pixel has no influence on the points. The abnormal pixel correcting part 28 performs sampling of density information of the read image data from the manuscript 13. Let an input density at the point a be Da and an input density at the point b be Db. The abnormal pixel correcting part 28 uses the input densities Da and Db to compute correction density. Linear interpolation is a statistical correcting method to compute the correction density. A density step AD is computed as follows;
.DELTA.D=(Db-Da)/(b-a). A density of each abnormal pixel is substituted for an interpolating density D as follows; D=Da+n.times..DELTA.D, where the notation n represents a distance between the point a and a position of the abnormal pixel. In a case that the manuscript 13 is solid, that is, the densities Da and Db have the almost same value, the correction density of an abnormal pixel resulting in a vertical streak is substituted for the input density Da or Db. On the other hand, in a case that there is a difference of the density between the points a and b, if the abnormal pixel should is corrected to have the same density as the input density Da, the parameter gives adverse influence to a corrected density of the abnormal pixel, thereby producing density mixture with neighboring pixels of the abnormal pixel in the shape of the vertical streak. Although the resulting image under the latter case makes a greater deal of improvement than the vertical streak showing up without any correction, the resulting image is inferior to the original image of the manuscript 13. Accordingly, the operator needs to check whether or not the correction is useful.

Detail Description Paragraph (45):
[0127] A result of the correction is illustrated in pattern diagrams in FIG. 29A through FIG. 29C. FIG. 29A illustrates data containing abnormal pixel 57 stored in the buffer memory 26. In this diagram, a black streak 90 is information indicating a position of a abnormal pixel. FIG. 29B illustrates an image 91 read from the manuscript 13. In this diagram, there are many black streaks 92 caused by abnormal pixels, thereby having trouble transferring information of the manuscript 13. FIG. 29C illustrates an image 93 resulting from correcting the image 91. In the resulting image 93, a considerable number of black streaks are deleted. The image data 93 is interpolated by using surrounding pixels-in the main-scan direction. As a result, if a corrected range originates from a white-solid range or a black-solid range, corrected density does not deteriorate because the correction uses uniform density of the solid range. However, a density difference may be identified from the neighborhood of the abnormal pixel, because the correction uses a variance of the density level. The abnormal pixel data 57 and the image 93 are displayed under the operation displaying part 23 so that an operator can set a level of correction freely. As a result, the operator can obtain an image that the operator recognizes to be appropriate. In this case, when the correction is performed to the extent that the black streaks are completely deleted, a dot range of the manuscript 13 deteriorates in comparison with the original one. Even if the correction is not performed to the extent, the number of the black streaks 92 decreases as shown in FIG. 29C. Accordingly, there is great improvement on image recognition.

3. Document ID: US 20020186386 A1

L2: Entry 3 of 23   File: PGPB   Dec 12, 2002

DOCUMENT-IDENTIFIER: US 20020186386 A1
TITLE: Printing apparatus, control method therefor, and program

Current US Classification, US Primary Class/Subclass (1):
358/1.8

Current US Classification, US Secondary Class/Subclass (1):
358/1.9

Detail Description Paragraph (281):
[0316] As a result, in the worst case, an image printed at an odd-numbered dot
position interferes with an image printed at an even-numbered dot position. In
addition, print density differences or gradients or differences in physical
positions such as landing positions or landing areas are produced. As a consequence,
density irregularity, streaks, and the like are produced in printed images.

| Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Image |

☐ 4. Document ID: US 20020063873 A1

L2: Entry 4 of 23   File: PGPB   May 30, 2002

DOCUMENT-IDENTIFIER: US 20020063873 A1
TITLE: Dot recording method and dot recording apparatus

Current US Classification, US Primary Class/Subclass (1):
358/1.8

Current US Classification, US Secondary Class/Subclass (1):
358/1.9

Detail Description Paragraph (105):
[0167] At step S2, the inspector observes the plurality of printed test patterns and
selects the dot recording scheme that attains an image of the highest quality. The
test image used here is an image that may cause a conspicuous banding (a streak-like
poor image quality portion extending in the main scanning direction) according to
the actual nozzle positions. Available examples of the test image include a gray
pattern (an image of a single color) having a uniform density of about 50% to 70%, a
gray scale (an image including an array of areas (patches) having different
densities), and an image of uniform flesh tint.

| Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | | KWIC | Draw Desc | Image |

☐ 5. Document ID: US 6545770 B2

L2: Entry 5 of 23   File: USPT   Apr 8, 2003

DOCUMENT-IDENTIFIER: US 6545770 B2
TITLE: Dot recording method and dot recording apparatus

Detailed Description Text (88):
At step S2, the inspector observes the plurality of printed test patterns and
selects the dot recording scheme that attains an image of the highest quality. The
test image used here is an image that may cause a conspicuous banding (a streak-like
poor image quality portion extending in the main scanning direction) according to
the actual nozzle positions. Available examples of the test image include a gray

pattern (an image of a single color) having a uniform density of about 50% to 70%, a gray scale (an image including an array of areas (patches) having different densities), and an image of uniform flesh tint.

Current US Original Classification (1):
358/1.7

Current US Cross Reference Classification (1):
358/1.12

Current US Cross Reference Classification (2):
358/1.13

| Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | | KWIC | Draw Desc | Image |

☑ 6. Document ID: US 6366358 B1

L2: Entry 6 of 23   File: USPT   Apr 2, 2002

DOCUMENT-IDENTIFIER: US 6366358 B1
TITLE: Method and apparatus for detecting stripe defects of printed matter

Detailed Description Text (17):
As the result of the calculation using the above equations (1) and (2), there can be prepared the binary image having the density difference of not less than the threshold value T1, that is, comprising only the edges of the clear extracted line or pattern. There is shown in FIG. 17 the above binary image taking the case of FIG. 16 schematically showing an image to be inspected comprising a pattern P and a streak-like defect (doctor streak) D. That is, there can be obtained the binary-coded image in which the edge of only the pattern P having a clear shade is extracted, whereas the edge of the line-like (streak-like) portion, which is low in contrast, such as the doctor streak or the like is not extracted. Then, according to the edge of the image shown in FIG. 17, the mask image comprising a mask portion M having a width enough to mask the edge can be prepared, as shown in FIG. 18.

Detailed Description Text (20):
In concrete terms, in order to detect the longitudinal streak-like defects, calculating the difference of the pixel values between the pixels with respect to the horizontal direction causes all the edges to be obtained. On this occasion, applying to the respective pixels the differential operator, represented by the use of the following equation (3), corresponding to the arrangement of the pixels in the horizontal direction schematically shown in FIG. 19 causes all the edges each including a line portion having a low contrast to be extracted, which enables the edge image including an arbitrary edge corresponding to the density difference to be prepared. Incidentally, in the equation (3), D designates a separately set constant (D.gtoreq.1) of not less than 1. Suppose D=2 in this embodiment.

Current US Original Classification (1):
358/1.14

Current US Cross Reference Classification (1):
358/1.9

| Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | | KWIC | Draw Desc | Image |

☐ 7. Document ID: US 6356358 B1

L2: Entry 7 of 23   File: USPT   Mar 12, 2002

DOCUMENT-IDENTIFIER: US 6356358 B1
TITLE: Dot recording method and dot recording device

Detailed Description Text (104):
At step S2, the inspector observes the plurality of printed test patterns and
selects the dot recording scheme that attains an image of the highest quality. The
test image used here is an image that may cause a conspicuous banding (a streak-like
poor image quality portion extending in the main scanning direction) according to
the actual nozzle positions. Available examples of the test image include a gray
pattern (an image of a single color) having a uniform density of about 50% to 70%, a
gray scale (an image including an array of areas (patches) having different
densities), and an image of uniform flesh tint.

Current US Original Classification (1):
358/1.7

Current US Cross Reference Classification (4):
358/1.12

Current US Cross Reference Classification (5):
358/1.13

| Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | | KWIC | Draw Desc | Image |

☐ 8. Document ID: US 6335982 B1

L2: Entry 8 of 23   File: USPT   Jan 1, 2002

DOCUMENT-IDENTIFIER: US 6335982 B1
TITLE: Method and apparatus for inspecting streak

Brief Summary Text (7):
Thus, according to the judgement of the micro-filtering process, a difference of
density value of one pixel is firstly emphasized and thereafter, when the difference
is more than the predetermined value, the object to be inspected is judged to have a
defect. Therefore, unless the object to be inspected has a certain extent of the
difference of density, the surface defect, such as streaks, cannot be detected.

Brief Summary Text (8):
Since, for example, the above-mentioned streak etc. of low contrast, which is narrow
in width and long in the transporting direction, has a small density, the resultant
difference in density will be too small to exceed the threshold value. Thus, in this
case, it is impossible to detect such a streak or the like.

Current US Original Classification (1):
382/149

| Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | | KWIC | Draw Desc | Image |

☐ 9. Document ID: US 6292268 B1

L2: Entry 9 of 23   File: USPT   Sep 18, 2001

DOCUMENT-IDENTIFIER: US 6292268 B1
TITLE: Image processor and image processing method handling multilevel image data

Brief Summary Text (10):
According to the image data to be converted, streaks sometimes appear in the
post-conversion image data. Specifically, the gradation level 16 of the input image
data of 256 gradations completely corresponds to the gradation level 1 of the
post-conversion image data of 16 gradations, so that no error is caused. On the
contrary, for example, for the gradation level 8 of the 256-gradation image data,
since it is situated between the gradation level 0 and the gradation level 1 of the
16-gradation image data, an error is caused irrespective of which level it is
converted to. The error is dispersed to peripheral pixels. Consequently, image data
having the gradation level 8 of the 256-gradation image data are alternately
converted to the gradation level 0 and to the gradation level 1 of the 16-gradation
image data, so that the image data are represented with the gradation level 0 and
the gradation level 1 by dithering. Thus, in an image which changes with a gentle
density gradient between gradation levels accurately represented without any errors
and gradation levels represented by dithering, when the number of gradations is
reduced by error diffusion, the boundaries appear as streaks.

Detailed Description Text (15):
In the image processor configured as described above, although the gradation change
of the output data is moderate as mentioned above, peculiar streaks appear in the
output image when there is a gentle density gradient in the input image.

Detailed Description Text (17):
In the figure, when the input image data (original image data) has a gentle density
gradient ranging from the gradation level 1 to the gradation level 3 of the output
image, both an area (A) gradation-represented by dithering and an area (B) not
gradation-represented by dithering are present in the output image (multilevel error
diffusion image data). As a result, the difference in texture between the areas (A)
and (B) is visually seen as the streaks pseudo contours).

Current US Original Classification (1):
358/3.03

Current US Cross Reference Classification (1):
358/3.04

Current US Cross Reference Classification (2):
382/237

Current US Cross Reference Classification (3):
382/252

| Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | | KWIC | Draw Desc | Image |

☐ 10. Document ID: US 6072596 A

L2: Entry 10 of 23   File: USPT   Jun 6, 2000

DOCUMENT-IDENTIFIER: US 6072596 A
** See image for Certificate of Correction **
TITLE: Image recording apparatus

Detailed Description Text (165):
When inclination coefficients take forms shown respectively in FIGS. 24 (c) and 24
(d) as a result of changing the overlapping area to the foregoing in the case of

FIGS. 24 (b)-(d), black spots or black streaks, or white spots or white streaks were
caused when positions of print head 301G, 302G for green color and print head 301B,
302B for blue color are not registered accurately. However, if the inclination
coefficient takes a form shown in FIG. 24 (b), when an overlapping area is 100
pixels, namely about 8 mm, it was possible to prevent occurrence of unnatural white
lines and black lines, though the density jump was visually observed slightly. When
the overlapping area was 100 pixels or more, namely about 16 mm or more,
discontinuous density and deterioration of sharpness which was especially concerned
were not observed visually on a connection portion of print heads 301G and 302G for
green color and on a connection portion of print heads 301B and 302B for blue color.
In particular, in the case of the overlapping area of 600 pixels or more, namely of
50 mm or more, density difference between print heads was not observed visually even
when gradation reproduction between print heads was not conducted accurately.
Compared with these, when the overlapping area is less than 100 pixels, namely less
than 8 mm, continuity of density is poor.

Current US Original Classification (1):
358/401

| Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | | KWIC | Draw Desc | Image |

☐ 11. Document ID: US 5960109 A

L2: Entry 11 of 23   File: USPT   Sep 28, 1999

DOCUMENT-IDENTIFIER: US 5960109 A
TITLE: Single pass marker enclosed area detection system and method for a
photocopier

Detailed Description Text (18):
However, since the photoelectric conversion characteristics of the CCD line sensors
are different for each picture element and for each chip, the output from the
different CCD line sensors, reading the original sheet with the same density, will
be different so that the data will cause streaks or unevenness in the picture image
data if the signals are outputted as they are. For this reason, it is necessary to
apply various kinds of rectifying processes.

Current US Original Classification (1):
382/164

Current US Cross Reference Classification (1):
382/258

| Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | | KWIC | Draw Desc | Image |

☐ 12. Document ID: US 5799111 A

L2: Entry 12 of 23   File: USPT   Aug 25, 1998

DOCUMENT-IDENTIFIER: US 5799111 A
** See image for Certificate of Correction **
TITLE: Apparatus and methods for smoothing images

Detailed Description Text (62):
A known problem is analog recording noise which appears in pre-recorded video images

as horizontal stripes and streaks which are normally perceived as being colored. The streaks appear due to the PAL and NTSC video standards and prerecorded playback limitations. The streaking effects are often perceived as stripes due to brightness and color differences between adjacent video lines in various locations along the video lines, and detract from the quality of video and still video imagery.

Current US Original Classification (1):
382/254

Current US Cross Reference Classification (1):
358/447

Current US Cross Reference Classification (2):
358/463

Current US Cross Reference Classification (3):
382/263

Current US Cross Reference Classification (4):
382/266

Current US Cross Reference Classification (5):
382/275

| Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | | KWIC | Draw Desc | Image |

☐ 13. Document ID: US 5442462 A

L2: Entry 13 of 23   File: USPT   Aug 15, 1995

DOCUMENT-IDENTIFIER: US 5442462 A
TITLE: Apparatus and method for smoothing images

Detailed Description Text (64):
A known problem is analog recording noise which appears in pre-recorded video images as horizontal stripes and streaks which are normally perceived as being colored. The streaks appear due to the PAL and NTSC video standards and prerecorded playback limitations. The streaking effects are often perceived as stripes due to brightness and color differences between adjacent video lines in various locations along the video lines, and detract from the quality of video and still video imagery.

Current US Original Classification (1):
358/463

Current US Cross Reference Classification (1):
358/447

Current US Cross Reference Classification (2):
382/261

| Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | | KWIC | Draw Desc | Image |

☐ 14. Document ID: US 5371577 A

L2: Entry 14 of 23   File: USPT   Dec 6, 1994

DOCUMENT-IDENTIFIER: US 5371577 A
TITLE: Ozone filter used in electrophotographic apparatus including catalyst of CuO,
MnO.sub.2, and a water-soluble polymer

Brief Summary Text (6):
However, in recent years, progress of the electrophotography is remarkable to
provide high-quality images, pictorial full-colored images and computer-graphic
images, so that requirements for uniformity of images are markedly severe. Further,
by the provision of a high-speed and high-durability electrophotographic apparatus,
it has become possible to take a lot of copies at a time. In such conditions, image
defects in the form of a belt arise in a direction perpendicular to the rotating
direction of the electrophotosensitive member, i.e., in the generatrix direction of
the electrophotosensitive member. The image defects are observed as image unevenness
represented by a difference in reflection density of 0.05 or more. On investigation
of the cause of the image defects, we have found that a part of the
electrophotosensitive member (i.e., the hatched portion of the electrophotosensitive
member in FIG. 1) stopping at a position immediately below a primary charger and in
the exhaust passage has received some damage when the electrophotographic apparatus
is not operated. In such a case, the electrophotographic apparatus using the OPC
photosensitive member causes, e.g., a partial decrease in chargeability (i.e., white
dropout of an image in normal development and a black streak of an image in reversal
development) and the electrophotographic apparatus using the a-Si photosensitive
member causes an image blur (i.e., a decrease in resolution).

Current US Cross Reference Classification (2):
358/300

| Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | | KWIC | Draw Desc | Image |

☐ 15. Document ID: US 5177621 A

L2: Entry 15 of 23   File: USPT   Jan 5, 1993

DOCUMENT-IDENTIFIER: US 5177621 A
TITLE: Self-diagnostic system for image reading equipment

Detailed Description Text (462):
The original sheet is read as resolved into the colors, R, G and B, in five
channels, which correspond to the five divided parts, by means of the five CCD line
sensor units 226 in the imaging unit 37, and the data so read is amplified by the
amplifying circuit 231 up to the prescribed level, and then the data signals are
transmitted to a circuit on the main unit side by way of the transmission cable
connecting the unit and the main unit (231a in FIG. 42). Subsequently, in the sample
hold circuit, SH 232, the signals are processed for the rectification of their
waveforms through the removal of the noise components by means of the sample hold
pulse SHP (232a in FIG. 42). However, since the photoelectric conversion
characteristics of the CCD line sensors are different for each picture element and
for each chip, the output from the different CCD line sensors reading the original
sheet with the same density will be different, so that the data will cause streaks
or unevenness in the picture image data if they are output as they are. For this
reason, it is necessary to apply various kinds of rectifying processes.

Detailed Description Text (480):
In practice, however, the dark time output voltage from the line sensors have
moderate fluctuations within each channel, as shown in FIG. 53(c). If the adjusting
method mentioned above should be applied to a line sensor having such a
characteristic feature like this, a difference in level .DELTA.D appears in the
boundary region between the channels as illustrated in FIG. 53(d), so that the
differences in density in the boundaries between the channels will be expressed in

the form of streaks or unevenness if the data are output as they are.

Detailed Description Text (483):
white background output amounts, for example, to 400 mV, and this value as converted
into the chromatic difference .DELTA.E is at the level of approximately 2 on the
gray scale. Thus, if the level difference .DELTA.D in the boundaries between the
channels as shown in FIG. 53(d) is output as it is to form an image, the difference
in density in the boundaries between the channels will express itself in the form of
a streak or unevenness. If it is to be attempted to reduce the chromatic difference
.DELTA.E on the gray scale at a level downward of 1 in order to cancel off this
defect, it is necessary either to suppress the .DELTA.V.sub.dark to 1 mV or to
increase the white background output to 800 mV by doubling the amount of the light.

Current US Original Classification (1):
358/406

Current US Cross Reference Classification (1):
358/405

| Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | | KWIC | Draw Desc | Image |

☐ 16.   Document ID: US 5157518 A

L2: Entry 16 of 23   File: USPT   Oct 20, 1992

DOCUMENT-IDENTIFIER: US 5157518 A
TITLE: Image data control system for image reading equipment

Brief Summary Text (8):
However, the characteristics of the photoelectric conversion by the CCD line sensor
are such that there occurs a difference in the level of signals between the
individual channels and the individual picture elements as illustrated in FIG. 39
(a), where the reading signal level for the white reference board is represented as
"the white color" while the signal level at the dark time output with no input of
light is represented as "the black color". Hence, it is conveivable to match the
average level of the individual channels. However, such an adjustment would cause
the occurrence of differences in the grades of density due to the differences in the
level in the marginal parts of the individual channels. Moreover, it is also
conceivable to match the level in the marginal parts of the individual channels, but
an adjustment like this, which would eliminate the differences in the grade of
density in the marginal parts of the channels, would nevertheless liable to the
appearance of streaks or uneven coloring in the supplementary scanning direction on
copies in consequence of the inconsistency caused to appear in the individual
picture elements or in the region in the principal scanning direction in consequence
of the fluctuations in the density level because there would be differences in the
output even in the reading of an original sheet in the same density.

Detailed Description Text (502):
The photoelectric conversion characteristics of the CCD line sensor are different
from one picture element to another and from one chip to another. Therefore, the
output generated even from reading an original sheet with the same density will be
different. If such signals are output as they are, streaks or unevenness will appear
in the image data. For this reason, it is necessary to perform such correcting or
adjusting processes as the gain control, the offset control, the .DELTA.V dark
correction, and the shading correction.

Current US Original Classification (1):
358/461

Current US Cross Reference Classification (1):

358/443

Current US Cross Reference Classification (2):
358/446   .

| Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | | MMC | Draw Desc | Image |

☐   17.   Document ID: US 5146311 A

L2: Entry 17 of 23   File: USPT   Sep 8, 1992

DOCUMENT-IDENTIFIER: US 5146311 A
TITLE: Method of indentifying and quantifying oxides on rolled metal strip

Detailed Description Text (28):
With removal of both streak and speck oxides, background oxides remain, and are
identified as such by the comparison process of 36. And, specks and background
oxides are of such a nature (i.e., difference in darkness or pixel intensities) that
thresholding alone provides their detection.

Current US Cross Reference Classification (2):
382/263

| Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | | MMC | Draw Desc | Image |

☐   18.   Document ID: US 5032903 A

L2: Entry 18 of 23   File: USPT   Jul 16, 1991

DOCUMENT-IDENTIFIER: US 5032903 A
TITLE: Edge processing system for color image processing system

Detailed Description Text (242):
The original sheet is read as resolved into the colors, R, G and B, in five
channels, which correspond to the five divided parts, by means of the five CCD line
sensor units 226 in the imaging unit 37, and the data signals so read off are
amplified by the amplifying circuit 231 up to the prescribed level and then
transmitted to a circuit on the main unit side by way of the transmission cable
connecting the unit and the main unit (231a in FIG. 20). Subsequently, in the sample
hold circuit, SH 232, the signals are processed for the rectification of their
waveforms through the removal of noise components by means of the sample hold pulse
SHP (232a in FIG. 20). However, since the photoelectric conversion characteristics
of the CCD line sensors are different for each picture element and for each chip,
the output from the different CCD line sensors reading the original sheet with the
same density will be different, so that the data will cause streaks or unevenness in
the picture image data if they are output as they are. For this reason, it is
necessary to apply various kinds of rectifying processes.

Current US Original Classification (1):
358/530

Current US Cross Reference Classification (1):
358/448

| Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | | KWIC | Draw Desc | Image |

☐ 19.   Document ID: US 5014123 A

L2: Entry 19 of 23   File: USPT   May 7, 1991

DOCUMENT-IDENTIFIER: US 5014123 A
** See image for Certificate of Correction **
TITLE: Film image reading system

Detailed Description Text (220):
The original sheet is read as resolved into the colors, R, G and B, in five
channels, which correspond to the five divided parts, by means of the five CCD line
sensor units 226 in the imaging unit 37, and the data so read off being amplified by
the amplifying circuit 231 up to the prescribed level and then the data signals are
transmitted to a circuit on the main unit side by way of the transmission cable
connecting the unit and the main unit (231a in FIG. 20). Subsequently, in the sample
hold circuit, SH 232, the signals are processed for the rectification of their
waveforms through the removal of noise components by means of the sample hold pulse
SHP (232a in FIG. 20). However, since the photoelectric conversion characteristics
of the CCD line sensors are different for each picture element and for each chip,
the output from the different CCD line sensors reading the original sheet with the
same density will be different, so that the data will cause streaks or unevenness in
the picture image data if they are output as they are. For this reason, it is
necessary to apply various kinds of rectifying processes.

Current US Original Classification (1):
358/506

Current US Cross Reference Classification (1):
358/516

| Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | | KWIC | Draw Desc | Image |

☐ 20.   Document ID: US 4380023 A

L2: Entry 20 of 23   File: USPT   Apr 12, 1983

DOCUMENT-IDENTIFIER: US 4380023 A
TITLE: Electronic imaging apparatus with light valve area arrays

Brief Summary Text (9):
Specifically, transverse banding artifacts (lines or streaks of different density
extending transverse to the direction of relative motion between the imaging medium
and linear array) sometimes occur because of improper synchronization between the
electrical imaging signals and the physical motion between the image medium and
imaging array. Such synchronization lapses, herein termed generally "flutter", can
have many causes, e.g., imprecision of the movement of the imaging medium (such as
can be caused by vibrations or "loose" tolerances) or variations in the frequency of
the electrical signal (such as caused by imprecise movement of a recording medium on
which the signal is stored). There are various synchronizing techniques to minimize
these flutter artifacts; however, the remedies add to machine complexity and cost.

Brief Summary Text (10):
Also, imaging with linear arrays can give rise to longitudinal banding artifacts
(lines or streaks of different density extending in the same direction as the

relative motion between the linear array and the imaging medium) because of
transmission non-uniformities between adjacent light valve elements in the linear
array.

Current US Original Classification (1):
358/505

Current US Cross Reference Classification (3):
358/509

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│ Full│ Title │ Citation │ Front │ Review │ Classification │ Date │ Reference │ Sequences │ Attachments │     │ KWIC │ Draw Desc │ Image │
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☐ 21. Document ID: US 4378567 A

L2: Entry 21 of 23   File: USPT   Mar 29, 1983

DOCUMENT-IDENTIFIER: US 4378567 A
TITLE: Electronic imaging apparatus having means for reducing inter-pixel
transmission nonuniformity

Brief Summary Text (8):
In certain applications, e.g. where it is desired to produce high quality continuous
tone images such as photographic prints, a detractive artifact has been noted in
imaging with light valve arrays that are electrically addressed by the
above-described techniques. Specifically, in continuous tone areas a visible density
difference is sometimes evident between adjacent pixel regions which have been
exposed by light valves that received substantially identical electrical
energizations. These density differences are particularly detractive when exposure
is made with relative movement between the imaging media and linear light valve
arrays and appear as streaks or bands.

Detailed Description Text (6):
It will be appreciated that all multicolor information can be input during a single
pass of the recording medium (in which case the illumination source would provide at
three separate color pulses per line) or that the medium can make multiple passes
(e.g. once for each of red, green and blue exposures). Regardless of which of these
or other addressing approaches is utilized, it is highly desirable that the pixels
of light valve array 13 exhibit a uniform modulating response. It has been noted,
however, that in prior art apparatus complete uniformity of response is quite
difficult to attain and as a result bands or streaks are sometimes visible on the
recording medium as differences in density due to different exposures by differently
modulating pixels of prior art arrays. This can be more fully appreciated if it is
supposed that a prior art light valve array located in place of array 13 in the FIG.
1 apparatus is addressed to uniformly expose all portions of the medium M moving
past the exposure station. Thus all pixels of the modulator would be addressed with
the same activating voltage for each line. The result should be a completely uniform
density; however, if the individual pixels exhibit nonuniform response the density
of bands respectively exposed by each (indicated by dotted lines in FIG. 1) will
have a different density which is detractive, particularly in continuous tone areas
of an image.

Current US Original Classification (1):
358/505

Current US Cross Reference Classification (1):
358/296

Current US Cross Reference Classification (2):
358/509

| Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | | KWIC | Draw Desc | Image |

☐ 22. Document ID: US 4371892 A

L2: Entry 22 of 23   File: USPT   Feb 1, 1983

DOCUMENT-IDENTIFIER: US 4371892 A
TITLE: Light valve imaging with optimized addressing potential(s) to reduce
inter-pixel nonuniformity   .

Brief Summary Text (9):
In certain applications, e.g. where it is desired to produce high quality continuous
tone images such as photographic prints, a detractive artifact has been noted in
imaging with light valve arrays that are electrically addressed by the
above-described techniques. Specifically, in continuous tone areas a visible density
difference is sometimes evident between adjacent pixel regions which have been
exposed by light valves that received substantially identical electrical
energizations. When exposure is made with relative movement between the imaging
media and linear light valve arrays, these density differences are particularly
detractive, appearing as streaks or bands.

Detailed Description Text (5):
The movement of recording medium by transport 16, the energization of illumination
source 11 by color control 17 and the activation of shift register 25 by address
control 18 are all synchronized, e.g. by synchronization control 19 so that the
P.sub.1 -P.sub.5 pixel portions of each line of the recording medium are exposed or
not to the different colors of light in accordance with the color image information
of the image to be reproduced. That image information is carried to address control
in the form of an electrical image signal, e.g. such as a T.V. video signal. It will
be appreciated that all multicolor information can be input during a single pass of
the recording medium (in which case the illumination source would provide at least
three separate color pulses per line) or that the medium can make multiple passes
(e.g. once for each of red, green and blue exposures). Regardless of which of these
or other addressing approaches is utilized, it is highly desirable that the pixels
of modulator 13 exhibit a uniform modulating response. It has been noted, however,
that complete uniformity of response is quite difficult to attain and as a result
bands or streaks are sometimes visible on the recording medium as differences in
density due to different exposures caused by non-uniformity in the pixels of
modulator such as 13. This can be more fully appreciated if it is supposed that
modulator 13 in FIG. 1 is addressed to uniformly expose all portions of the medium M
moving past the exposure station. Thus all pixels of the modulator would be
addressed with the same activating voltage for each line. The result should be a
completely uniform density; however, if the individual pixels exhibit non-uniform
response, the density of bands respectively exposed by each (indicated by dotted
lines in FIG. 1) will have a different density which is detractive, particularly in
continuous tone areas of an image.

Current US Original Classification (1):
358/505

Current US Cross Reference Classification (1):
358/509

| Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | | KWIC | Draw Desc | Image |

☐ 23. Document ID: US 4357625 A

DOCUMENT-IDENTIFIER: US 4357625 A
TITLE: Light valve imaging apparatus having enlarged pixel exposing regions

Brief Summary Text (9):
In certain applications, e.g. where it is desired to produce high quality continuous
tone images such as photographic prints, a detractive artifact has been noted in
imaging with light valve arrays of the kind described above. Specifically, in
continuous tone areas a visible density difference is sometimes evident between
adjacent pixel regions which have been exposed by light valves that received
substantially identical electrical energizations. These density differences appear
as particularly detractive streaks or bands when exposure is made with relative
movement between the imaging media and linear light valve arrays.

Detailed Description Text (6):
The movement of recording medium M through exposure zone 19 by transport 30, the
energization of illumination source 11 by color control 31 and the activation of
addressing means 25 by address control 32 are all synchronized, e.g. by
synchronization control 33 so that the P.sub.1 -P.sub.10 pixel portions of each line
of the recording medium are exposed or not to the different colors of light in
accordance with the color image information of the image to be reproduced that is
carried to addressing control e.g. in the form of an electrical image signal. It
will be appreciated that all multicolor information can be input during a single
pass of the recording medium (in which case the illumination source would provide at
least three separate color pulses per line) or that the medium can make multiple
passes (e.g. once for each of red, green and blue exposures). Regardless of which of
these or other addressing approaches is utilized, it is highly desirable that the
different pixel portions of the recording medium receive the same exposure when the
light valve is addressed to provide equal exposures thereto. It has been noted,
however, that in prior art techniques complete uniformity of response is quite
difficult to attain; and as a result, bands or streaks are sometimes visible on the
recording medium as differences in density due to different exposures by differently
modulating pixel exposing regions of the light valve arrays. This can be more fully
appreciated if it is supposed that a light valve array is addressed to uniformly
expose all portions of the medium M moving past the exposure station. Thus all pixel
exposing regions of the array modulator would be addressed with the same activating
voltage for each line. The result should be a completely uniform density; however,
if the individual light valve pixel regions exhibit non-uniform response the bands
respectively exposed by each (indicated by dotted lines in FIG. 1) will have a
different density which is detractive, particularly in continuous tone areas of an
image.

Current US Original Classification (1):
358/505

Current US Cross Reference Classification (1):
358/509

| Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | | KWIC | Draw Desc | Image |

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